

IN THE CLAIMS

1. (withdrawn): A semiconductor device using a LOCOS method for element isolation comprising: a silicon layer in an element isolation region having an inclined part in a sectional shape;

a metal oxide film for generating a fixed electric charge, formed on the silicon layer in the element isolation region having the inclined part; and

a field oxide film formed on the metal oxide layer.

2. (withdrawn): A semiconductor device according to claim 1 wherein the silicon layer is a silicon layer of an SOI structure formed on an insulating oxide layer.

3. (withdrawn): A semiconductor device according to claim 1 wherein the element is an N-channel MOSFET and the fixed electric charge is a negative fixed electric charge.

4. (withdrawn): A semiconductor device according to claim 3 wherein the metal oxide film is aluminum oxide.

5. (currently amended): A method of manufacturing a semiconductor device using a LOCOS method for element isolation comprising the steps of:

forming a pad oxide film and a nitride film sequentially on a silicon layer in an element region;

forming a metal oxide film for generating a fixed electric charge on the nitride film and on the silicon layer at least in an edge region of an element isolation region;

forming a field oxide film in the element isolation region by implementing an oxidation treatment; and

removing the metal oxide film on the nitride film, the nitride film and the pad oxide film;

whereby a threshold voltage of a parasitic transistor formed between the silicon layer and the field oxide film is raised and an influence of leakage current is reduced.

6. (currently amended): [[A]] The method of manufacturing a semiconductor device according to claim 5 wherein the silicon layer is a silicon layer of an SOI structure formed on an insulating oxide layer.

7. (currently amended): [[A]] The method of manufacturing a semiconductor device according to claim 5 wherein the element is an N-channel MOSFET and the fixed electric charge is a negative fixed electric charge.

8. (currently amended): [[A]] The method of manufacturing a semiconductor device according to claim 7 wherein the metal oxide film is aluminum oxide.

9. (currently amended): A method of manufacturing a semiconductor device using a LOCOS method for element isolation comprising the steps of:

forming a pad oxide film and a nitride film sequentially on a silicon layer in an element region;

forming a field oxide film in an element isolation region by implementing an oxidation treatment;

implanting an impurity into the field oxide film at least in an edge region of the element isolation region to generate a fixed electric charge on the field oxide film; and

removing the nitride film and the pad oxide film;

whereby a threshold voltage of a parasitic transistor formed between the silicon layer and the field oxide film is raised and an influence of leakage current is reduced.

10. (currently amended): [[A]] The method of manufacturing a semiconductor device according to claim 9 wherein the silicon layer is a silicon layer of an SOI structure formed on an insulating oxide layer.

11. (currently amended): [[A]] The method of manufacturing a semiconductor device according to claim 9 wherein the impurity is implanted by a diagonal ion implantation.

12. (currently amended): ~~[[A]]~~ The method of manufacturing a semiconductor device according to claim 9 wherein the element is an N-channel MOSFET and the fixed electric charge is a negative fixed electric charge.

13. (currently amended): ~~[[A]]~~ The method of manufacturing a semiconductor device according to claim 12 wherein the impurity is a fluorine ion.

14. (new): The method of manufacturing a semiconductor device according to claim 5, wherein the step of forming a field oxide film in the element isolation region by implementing an oxidation treatment comprises:

forming an inclined edge of the silicon layer; and
covering the inclined edge with a metal oxide film.

15. (new): The method of manufacturing a semiconductor device according to claim 11, wherein

the step of forming a field oxide film in the element isolation region by implementing an oxidation treatment comprises forming an inclined edge of the silicon layer; and

the step of implanting an impurity into the field oxide film comprises directing the diagonal ion implantation generally perpendicular to the inclined edge.